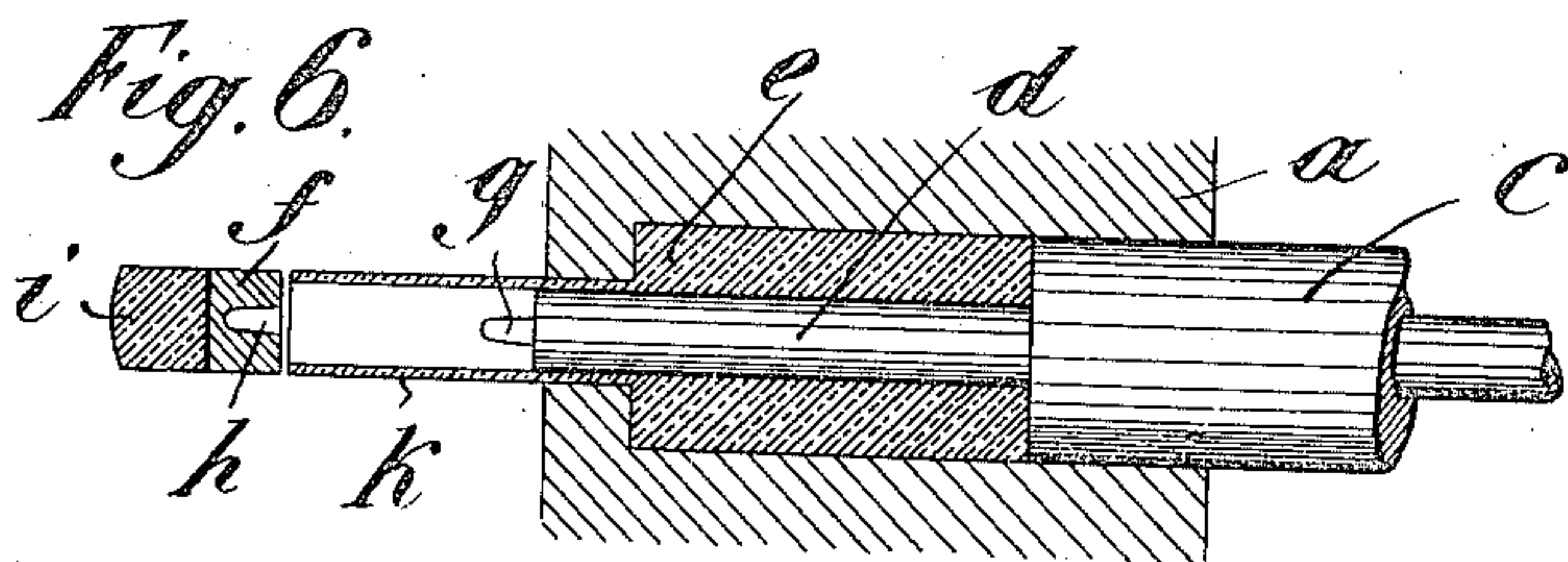
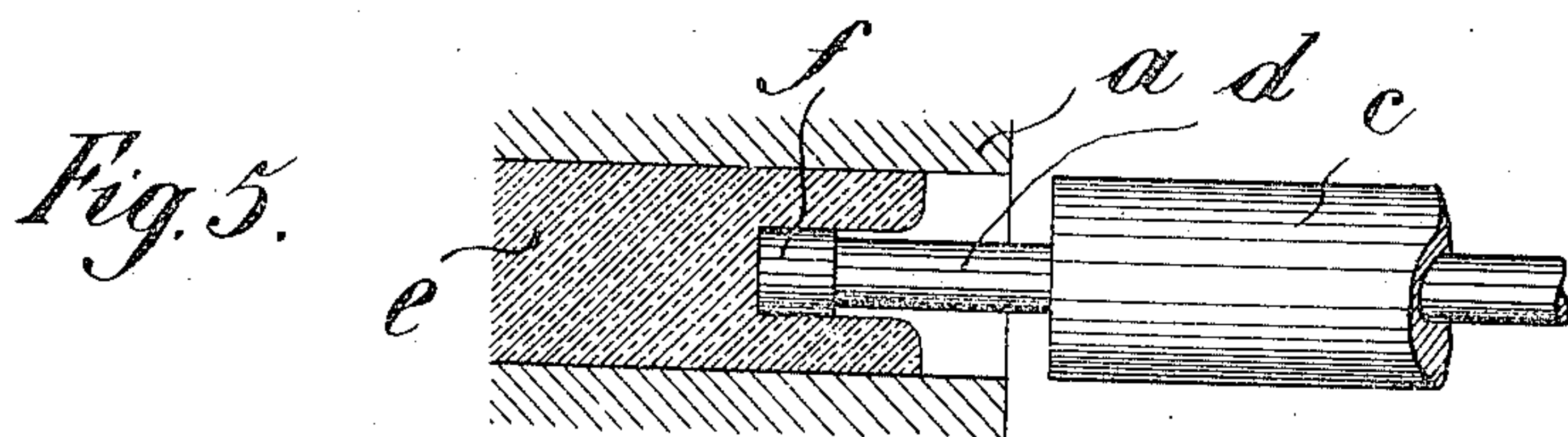
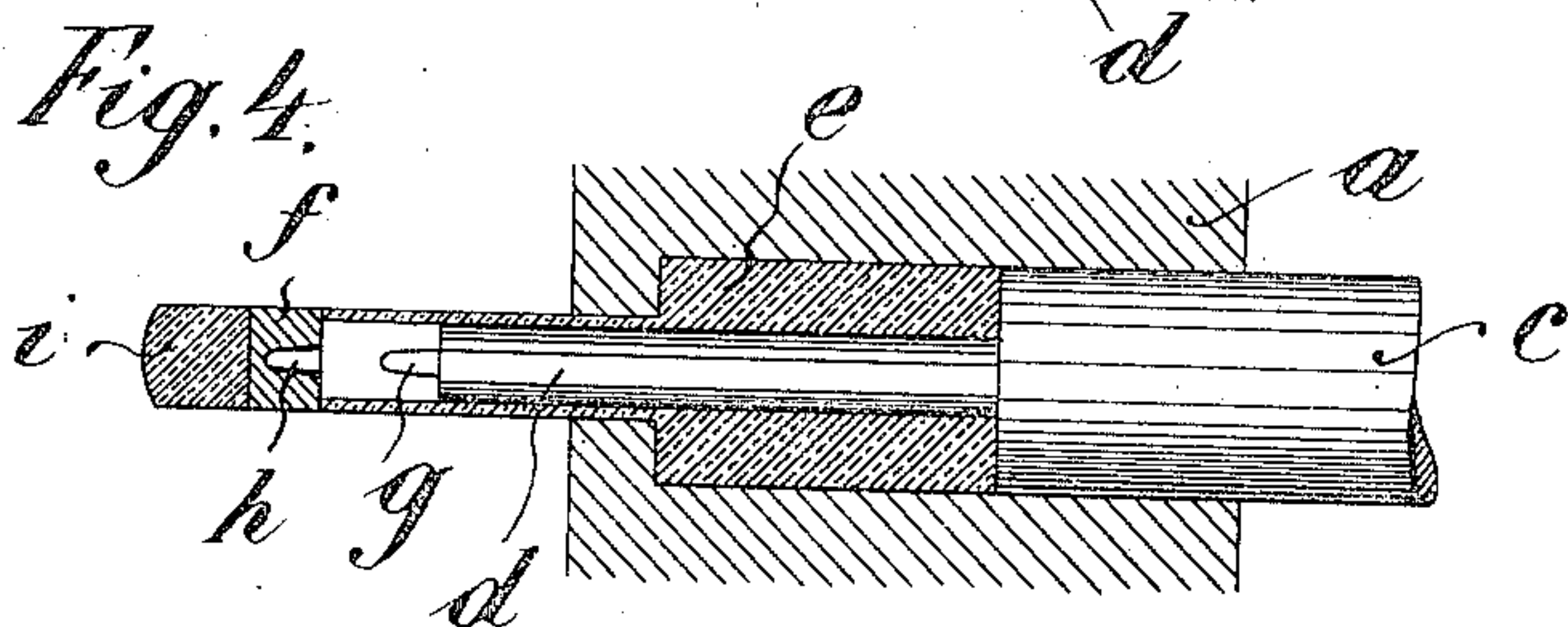
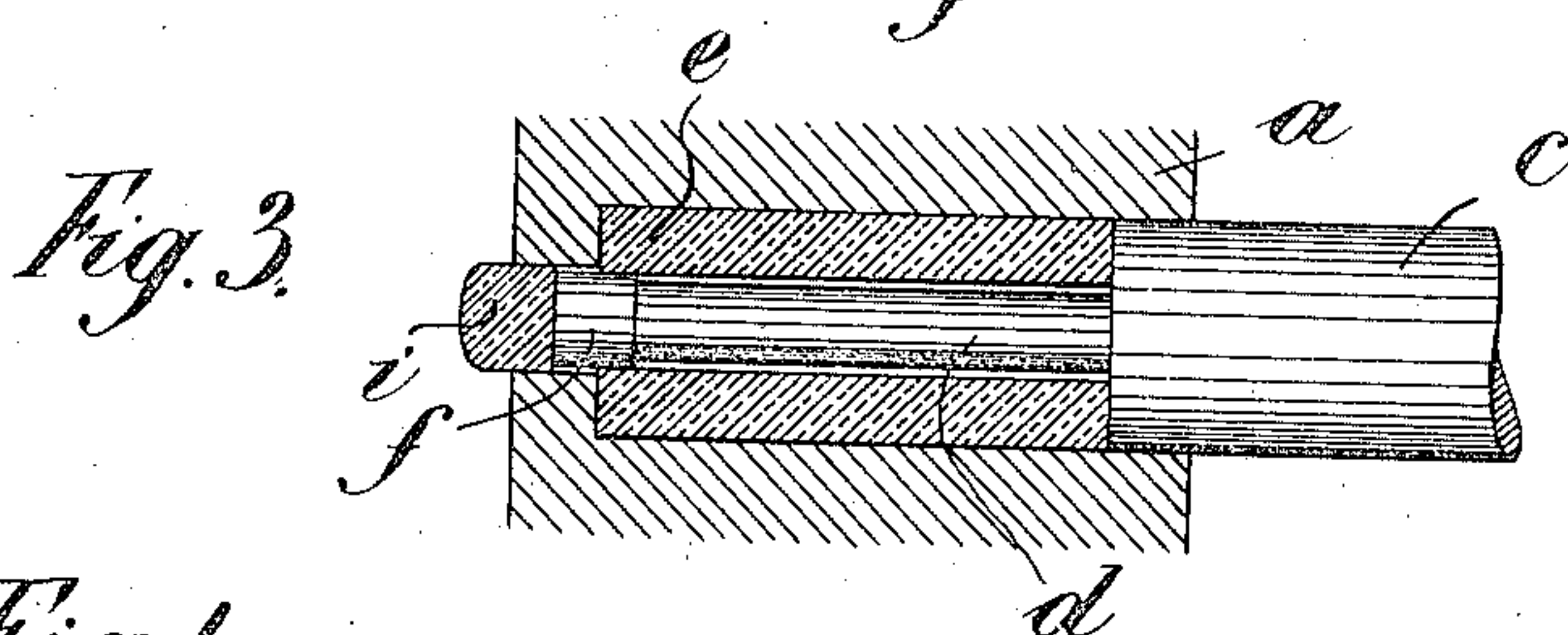
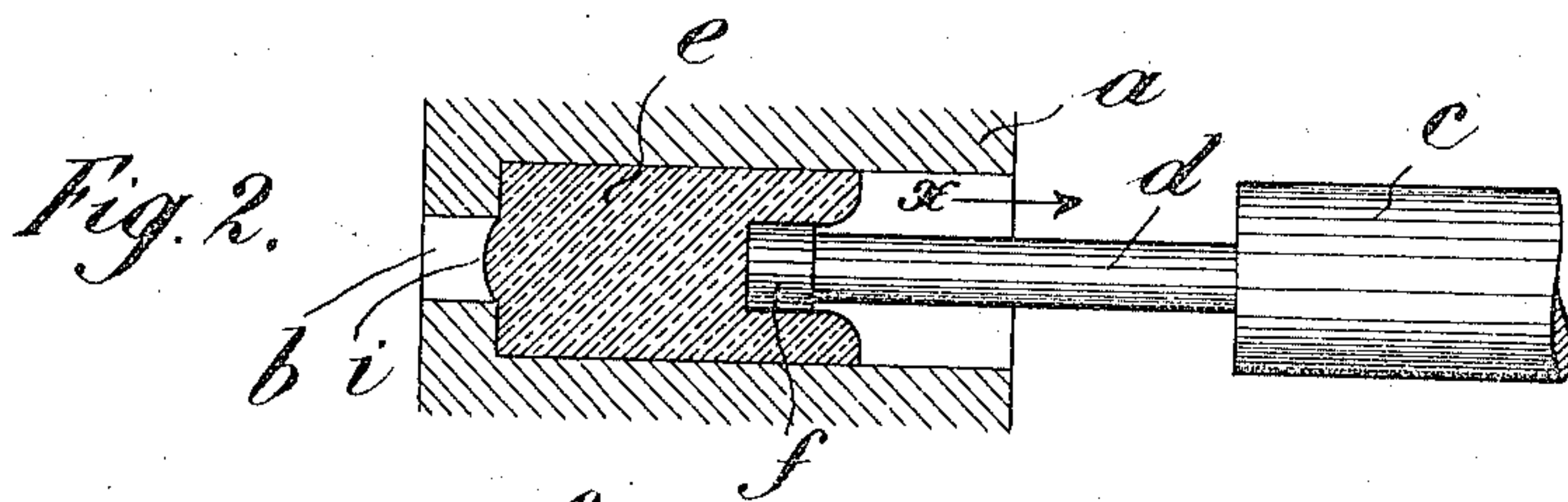
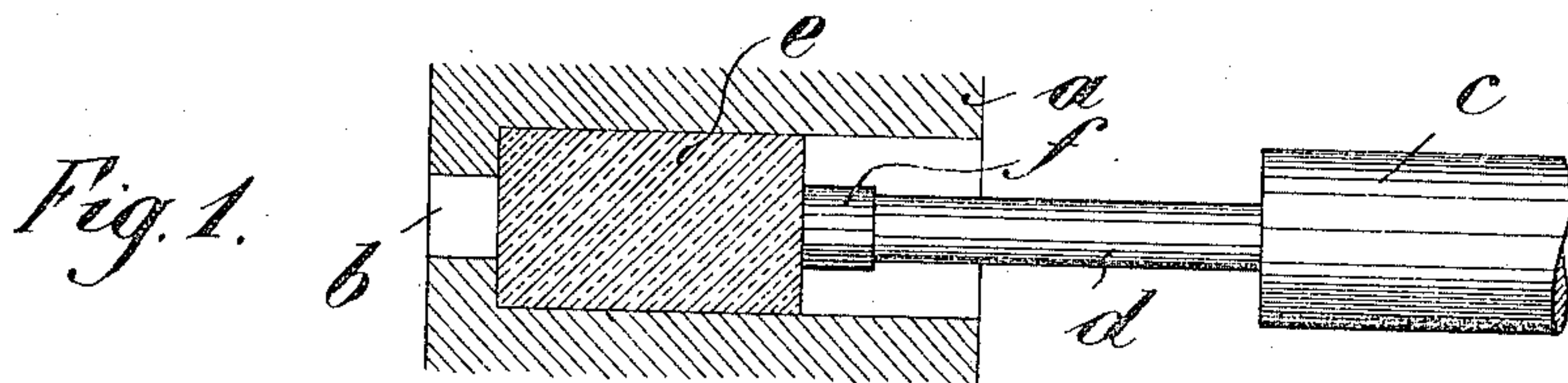


No. 847,635.

PATENTED MAR. 19, 1907.

W. ASTFALCK.
PRESS FOR FORMING TUBES, &c.
APPLICATION FILED OCT. 1, 1906.



Witnesses
J. M. Olynkoop,
H. H. Totten.

Inventor
Wilhelm Astfalck.
By Knight & Co.
Attys.

UNITED STATES PATENT OFFICE.

WILAND ASTFALCK, OF TEGEL, NEAR BERLIN, GERMANY.

PRESS FOR FORMING TUBES, &c.

No. 847,635.

Specification of Letters Patent.

Patented March 19, 1907.

Application filed October 1, 1906. Serial No. 336,966.

To all whom it may concern:

Be it known that I, WILAND ASTFALCK, engineer, a subject of the German Emperor, residing at No. 21 Schloss-strasse, of Tegel, near Berlin, in the Kingdom of Prussia and German Empire, have invented certain new and useful Improvements in Presses for Forming Tubes and Tubular Hollow Bodies, of which the following is a specification.

10 This invention relates to a press for forming tubes and tubular hollow bodies from a solid metal block or blank, which is punched in one operation by means of a mandrel driven into the matrix-hole and then pressed, 15 by means of a press-ram, between the mandrel and the matrix-wall.

Hitherto a cylindrical mandrel was used, which when punching the metal block comes in contact with the incandescent mass in its 20 entire length, squeezes through the metallic mass, assumes the temperature of the same, and is thus deprived of its tenacity. Moreover, when the said mandrel passes through the incandescent mass its surface undergoes 25 changes of shape, and when it finally acts as a mandrel it is no longer resistable enough and is sometimes even throttled. At any rate, its upper surface is so affected that it no longer has the accurate shape and dimensions 30 which it ought to have.

According to the present invention this drawback is overcome by making the mandrel thicker at its front end, whereupon this thicker head is loosely mounted on the mandrel-rod, and after punching the metal block the head is broken off by the tube which is being formed. The mandrel-shank does not then come in direct contact with the metal when punching and cannot, therefore, be in 40 the same incandescent state as the mass itself. Moreover, owing to the obviation of friction between the mandrel and the metal block when punching and owing to less heating when punching, a higher specific pressure is exerted on the mandrel and a better product formed, as in the event of a higher specific pressure the metal block is more strongly compressed and a more homogeneous tube passes out of the press. Tubes of 50 less diameter may also be pressed, because the mandrel is not heated in the mass as hitherto. Further, only the mandrel-head need be replaced if it has been changed through the repeated working process, while hitherto the whole mandrel had to be replaced or shortened. Finally, the new man-

drel has also the essential advantage that it maintains a greater degree of rigidity, because it does not get excessively heated when punching the block, and it cannot, therefore, 60 yield in a lateral direction, which would lead to the formation of irregular-walled tubes.

Power is always saved when using the new mandrel, for when punching only the frictional resistance between the metal block, on 65 the one hand, and the press-cylinder and the mandrel-head, on the other hand, is to be taken into account, while with the ordinary mandrel the resistance on the entire length of the mandrel punching the metal is also to be 70 considered.

The accompanying drawing shows diagrammatically the respective part of a tube-forming press in three forms of construction.

Figures 1-4 are longitudinal sections 75 through the press-cylinder in different working positions of the mandrel and the press-ram. Figs. 5 and 6 are also longitudinal sections through the press-cylinder and show independently-operated mandrel and press- 80 ram. Fig. 7 is a side elevation of another form of construction of the mandrel.

The press-cylinder *a* is open at one end and has a matrix-hole *b* at the other end. A press-ram *c* and a mandrel *d* are arranged in 85 front of the press-cylinder *a* and adapted to reciprocate therein. In order that the mandrel can get into the operative position for the pressing operation, the mandrel *d* must first be forced through the solid metal block 90 or blank *e* inserted in the cylinder *a*.

According to this invention there is mounted on the mandrel *d* at the front end a head-piece *f*, which has a somewhat larger 95 diameter than the mandrel. In order that the head-piece *f* may remain on the mandrel *d* and not be easily knocked off, the mandrel is provided with a pin *g*, according to Fig. 4, and the head-piece is provided with a central hole *h*, wherein the pin *g* accurately 100 fits.

If the press-ram *c* is moved forward with the mandrel *d*, a portion of the metal then enters the matrix-hole *b* in the form of a plug *i*, Figs. 2 and 3. When the metal block *e* is 105 completely punched and the press-ram *c* bears against the metallic mass, Fig. 3, the pressing operation begins. By the pressure of the ram *c* the plug *i* and then the head-piece *f* of the mandrel *d* will be pressed out 110 through the matrix-hole *b*, and the tube *k*, Fig. 4, is formed about the mandrel *d*, enter-

ing the matrix-hole *b*. The head-piece *f* is thus stripped off the mandrel *d* by the following tube *k*.

In Figs. 1 and 4 the mandrel *d* is rigidly connected to the press-ram *c*. The mandrel *d* may, however, also be movably arranged in the press-ram *c* and operated independently thereof, as assumed in Figs. 5 and 6.

Fig. 7 represents a mandrel *d* the head-piece *f'* of which is offset. The working edge *m* has a diameter corresponding to the inside width of the matrix-hole.

What I claim as my invention, and desire to secure by United States Letters Patent, is—

1. An improved press for forming tubes and tubular hollow bodies from a solid metal block, comprising a press-cylinder terminating in a matrix, a mandrel and a press-ram, the said mandrel being provided with a head-piece projecting above the mandrel and loosely connected therewith substantially as described and shown in the drawing.

2. An improved press for forming tubes and tubular hollow bodies from a solid metal block, comprising a press-cylinder terminating in a matrix, a mandrel provided with a loosely-mounted head-piece and a press-ram, the said head-piece of the mandrel having a

working edge projecting above the mandrel, substantially as described and shown in the drawing.

3. An improved press for forming tubes and tubular hollow bodies from a solid metal block, comprising a press-cylinder terminating in a matrix, a mandrel provided with a loosely-mounted head-piece and a press-ram, the said head-piece of the mandrel having a working edge projecting above the mandrel and a diameter equal to the inside width of the matrix, substantially as described and shown in the drawing.

4. In a press for forming tubes and tubular bodies, a mandrel provided with a perforating-head loosely connected thereto.

5. In a press for forming tubes and tubular bodies, a mandrel provided with a perforating-head of greater diameter than the mandrel and adapted to be stripped off during the formation of a tube.

The foregoing specification signed, at Berlin, Germany, this 19th day of September, 1906.

WILAND ASTFALCK.

In presence of—

WOLDEMAR HAUPT,
HENRY HASPER.